Valorization of Diagnostic Innovations

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FOOD 2 KNOW

Overview

- The Agricultural and Environmental Diagnostic Market
- Intellectual Property (IP)
- Valorization of IP
- Industrial Standards
- Discounted Cash Flow (DCF) Methods
- Dividing the Intrinsic Value

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The Agricultural & Environmental Diagnostic Market

- The global market for analytical testing associated with the water and environmental industries was estimated in 2009 to be $1.4 billion.
- The overall growth rate in developed markets is estimated at 2 to 3%.
- The overall growth rate in BRICKs countries, primarily Asia, is estimated at 7 to 9%.
- Driver for growth: governement regulations.

Overview of Non-Clinical Diagnostic Market, Brocair Partners, **2009**.

The Agricultural & Environmental Market

- The US market for food (& feed) safety testing in 2009, was worth $3.3 billion.
- In 2017, the market should reach approximately $4.4 billion after a 5 year CAGR of 5.6%.
- Market van be broken down by type of target: pathogens ($3.9 billion), GMO ($167 mio), toxins ($162 mio) and residues ($140 mio).

The Agricultural & Environmental Market

- The Global Agricultural and Environmental diagnostic market will reach $3.8 billion by 2017 according to Global Industry Analysts Inc.
- Rapid and reliable testing methods are expected to capture more market share.
- Mayor players: Biocontrol Systems, Biomerieux, Charm Sciences, Eurofins Scientific, IDEXX, Neogen, R-Biopharm, Vicam, 3M, etc.

Agricultural & Environmental Diagnostics, Global Industry Analysts, **2011**.

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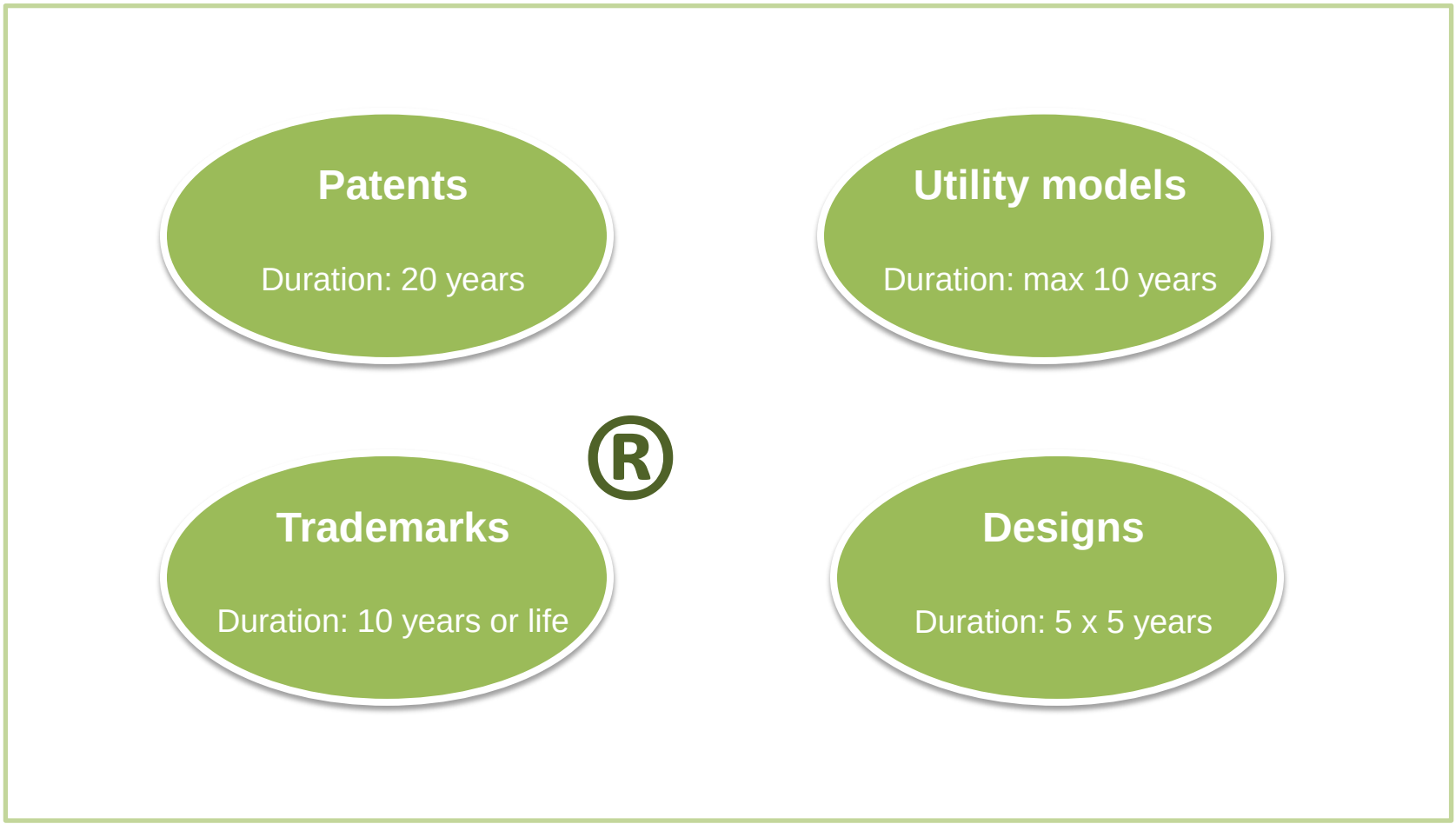
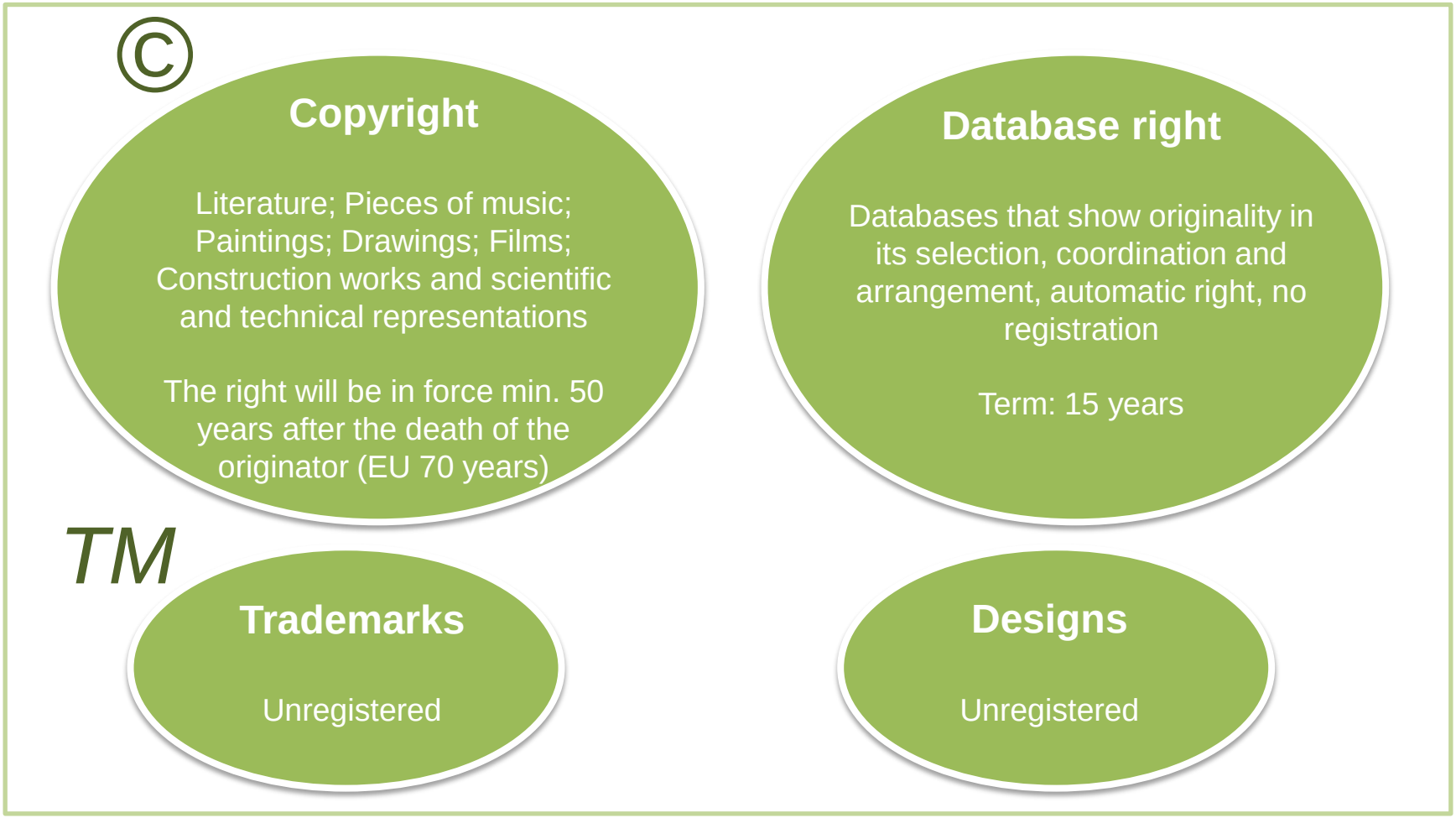
Innovation and Intellectual Property (IP)

- Creativity is the base of innovation and leads to economic value and competitive advantages.
- Through the proper use of intellectual property, one has a much better chance of transforming creativity into economic value.
- Intellectual property law recognizes a creator's rights in ideas, creations, innovations, and goodwill.
- Intellectual property differs from real property (land) or personal property (your possessions).

IP rights with a certificate

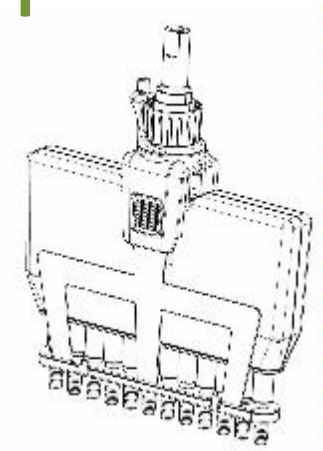


IP rights without a certificate



Some (non patent) Examples

oami.europa.eu: 136 entries for **registered "pipette "designs**



Design #: 000158803-0001
Merial Ltd. (29/3/2004)

Design #: 000203799-0001
Heathrow Scientific LLC. (14/7/2004)

Design #: 001065700-0001
Gilson Sas (5/1/2009)

www.uspto.gov: 37 entries for **registered "pipette" trade marks**

iPIPETTE

PRECISION PIPETTE
Because Precision Is Everything

Gilson Authorized Pipette Service

Trade Mark #: 85610923
Apricot Designs Inc. (25/12/2012)

Trade Mark #: 79018385
Precision Pipette Inc. (12/3/2002)

Trade Mark #: 79018385
Gilson Inc. (14/10/2012)

VERY IMPORTANT!

- First think about possible new intellectual property and the protection thereof.
- Before actually publishing or sharing information with third parties.
- Also an invoice counts as prior art (use a MTA before applying for a patent).
- If not all IP rights will/can be lost.

YES

Evaluate data or ideas for new IP and protect it

Publish new data and ideas

NO

Prior Art Search & Data Mining

- **Patents**: *www.wipo.int, www.uspto.gov, www.epo.org, espacenet.com, www.google.com/patents, ThomsonInnovation.com (pay site), www.pat2pdf.com, www.micropat.com (pay site), www.jpo.go.jp, www.jipo.cn, www.pctgazette.wipo.int, wipsglobal.com.*

- **Trademarks and related items**: *www.uspto.gov, oami.europe.eu, www.register.boip.int, www.wipo.int/madrid/en, www.cpvr.info, ec.europa.eu/agriculture/quality/index_en.htm, icann.org/registrars/accredited_list.html, www.eurid.eu, oami.europa.eu.*

- **Copyright**: *internet search engines, books, journals, magazines, flyers, brochures, www.sabam.be, www.guefa.de, www.copyright.gov, www.escroweurope.com, www.boip.int.*

What can be patented?

YES

1. A product
2. The apparatus for producing the product
3. The process for producing the product
4. The use of the product

NO

1. Computer programs
2. Medical and surgical treatments
3. Mathematical methods
4. Business methods
5. Discoveries
6. Aesthetic creations
7. New species of plant or animal
8. Inventions which are contrary to moral standards and public order (e.g. instruments of torture)
9. The human body and any non-separate part(s) thereof

Recent Important Changes

- On September 16, President Obama signed the "America Invents Act"
  -rolled out in 2012, 2013 – 2014
  -"first inventor to file" (cfr. Europe)

- On December 15, 2012, the EU signed the "European Unitary Patent" agreement
  -less expensive (less translations)
  -in English, German or French
  -Spain & Italy not participating (no Spanish or Italian)

Patenting Analytical Methods?

- Could be possible since it is a process with an industrial value e.g. for CRO as a service.
- After a patent has been filed, it will be published.
- How can one police this IP? – very difficult.
- Instead of filing for a patent, it could be better to keep it as a trade secret: no publication, no cost and not limited in time (as long as it is kept secret).

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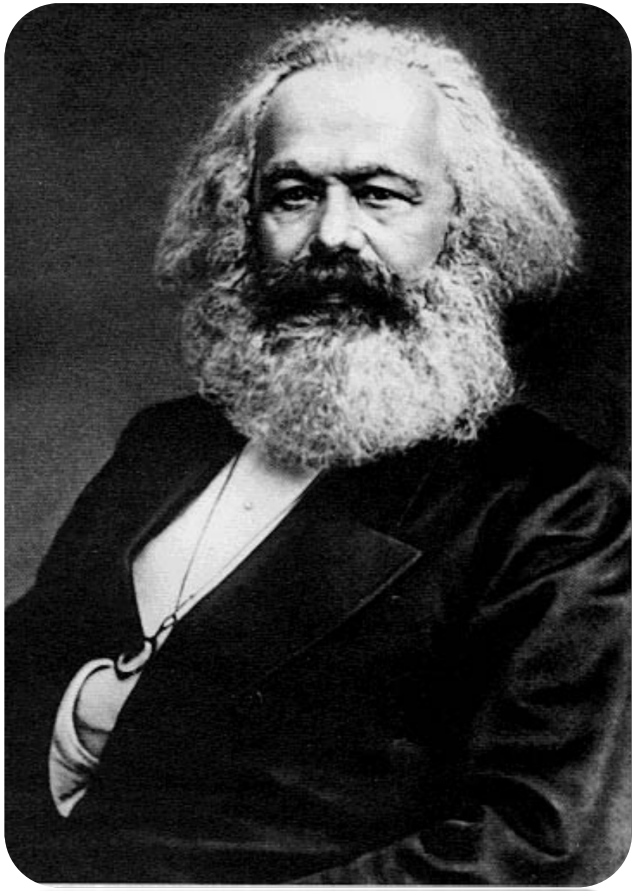
Valorization of IP

- A return needs to be created on new IP
- Karl Marx first introduced the term valorization in his work “Das Kapital”
- Original word used was “Kapitalverwertung”: the use or application of something so that it generates value
- It is important that a surplus value is created



Valorization of IP

- This can be done via different valorization routes/processes:
  - Develop the new IP into an article of commerce that can be sold
  - Out license the IP to another person or company
  - A new company e.g. a JV can be established
  - Not to render the new IP into an article to maintain the value of an existing business

→ The management of the valorization of new IP is actually Business Development. This includes identifying and evaluating a possible business, and then realizing its full potential, full value.

Valorization of IP

- Not all new IP can generate value and a lot of new technologies or products fail
- Germeraad *et al.:*
  - Over a 10 year period (1991-2000) more than US$ 200 billion invested in R&D at US universities
  - Resulted in 100 000 new patent disclosure
  - 50% were submitted for patent application
  - This yielded eventually 25 000 licenses and in the formation of 2 500 startup companies
  - Only 125 licenses that generate more than US$ 1 million per annum
  - Most of the licenses just bring in US$ 10 000 cumulatively

→ **Sad return on investment**

Baggott, S.; Germeraad, P.; Khan, R.; Oliver, W.; Peregrim, J.; Wandji, S.A, *Les Nouvelles*, **2008**, 261-271.

IP Valuation

- *Would it be lucrative to start this project?*
- *Is there a market for this?*
- *How much is new IP worth?*
- *In case of licensing: what terms & conditions?*

→ Questions that need to be answered before creating value on the new IP

- There are many techniques for valuation
- In this presentation we want to look at 2 different approaches:
  1. Using industrial standards
  2. Financial valuation via discounted cash flow methods

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Industrial Standards

- Most likely, historical data exists on previous done deals in a specific industrial sector for a specific type of technology or product
  - Established general terms & conditions (industry norms)
  - Business development literature
  - Business development communities
  - Databases (often pay)
  - Published agreements
  - Court cases

Industrial Standards

Example of a Court Case:

- Innogentics filed a patent in 1993 on hepatitis C genotyping.
- The patent was granted on December 8, 1998 (US5846704)
- Abbott was infringing the patent according to the decision of The Court in 2006 (Fed.Lir. 2008):
  -mayor companies had taken a license on the patent (i.e. non exclusive).
  -$7 mio in damages to be paid by Abbott, including $5.8 mio market entry fee and an ongoing royalty of €5 to €10 per test.

Established Industry Norms

- Easy approach requiring less effort
- Key is to have recent studies since the established norms can evolve over time
- Journals where information can be found:
  - Les Nouvelles
  - Licensing Economics Review
  - Journal of the Association of University Technology Managers
  - Review of Financial Economics
  - International Review of Economics and Finance

Established Industry Norms

Royalty rates dd. 2002 for different industries according to Muelhern *et al.*

INDUSTRY	Av. Oper. Margin	n (# of entries)	min. Royalty rate	Max. Royalty Rate	Median Royalty Rate
Automotive	5.0%	35	1.0%	15.0%	4.0%
Chemicals	11.1%	72	0.5%	25.0%	3.6%
Computers	6.9%	68	0.2%	15.0%	4.0%
Food	7.3%	32	0.3%	7.0%	2.8%
Pharma & Biotech	16.4%	328	0.1%	40.0%	5.1%
Software	18.8%	119	0.0%	70.0%	6.8%

Muelhern, C.; Jaroz, J.; Goldschneider, R., *Les Nouvelles*, **2002**, 123.

Established Industry Norms

Royalty rates according to Weinstein *et al.* dd. 2008

Industry	Number of observations	Average royalty rate	(+) / (-)	Lower bound	Upper bound
Medical device	77	4.35%	0.64%	3.71%	5.00%
Pharmaceutical	90	5.66%	0.91%	4.75%	6.57%
Chemical	21	3.70%	0.88%	2.82%	4.57%

Weinstein, R.; Mills, R.; Porter, M., *Les Nouvelles*, **2008**, 47.

- Variation over time
- Significant differences between sectors: cfr. different margins
- Differences between low and high return in a sector: cfr. stage of development, negotiation skills

Established Industry Norms

- The royalty rate is important
- Also important to evaluate different stage payments:
  - Upfront payment *i.e.* after signing the agreement
  - Various payments when a critical milestone has been reached or payment when a certain milestone in sales has been reached
- Licensors prefer higher stage payments and lower royalties
- Licensees prefer to agree on low stage payments and perhaps somewhat higher royalties

Historical Data on Deals

- More reliable for deal making can be the study of available historical data on relevant past deals
- The data needs to be for a similar product or technology for a similar industrial sector
- This can be purchased from:
  - RoyaltyStat
  - Recap
  - Pharmadeals
  - Datamonitor
  - Life Science Analytics (www.medtrack.com)
- This is often expensive
- Also: your own (company/institute/person) experience & data – much cheaper

Historical Data on Deals

Ghent University developed new technology related to mycotoxin testing and closed an agreement with an industrial partner for commercialization.

Mycotoxin Diagnostic	Deal Terms
Stage	Fully developed
IP	Patent & know how for the production of antibodies
Territory	Worldwide
Type	Non exclusive for production & commercialization
Stage payments	Not included
Duration	10 years, option to renew
Royalties	10% on Net sales up to $250000 9% on Net Sales up between $250001 and $500000 8% on Net Sales above $500001
Other	University to produce the antibody for Licensee @COGS + %

Historical Data on Deals

Ghent University developed new technology related to food safety modeling software and closed an agreement with an industrial partner for commercialization.

Food Safety Software	Deal Terms
Stage	Fully developed
IP	Software (©), Databases, Trademark,
Territory	worldwide
Type	Exclusive, for all IP and its commercialization
Stage payments	If sales reach €1 mio €50000 If sales reach €5 mio €200000
Duration	10 years, afterwards all rights will go to licensee
Royalties	7% on Net Sales

Historical Data on Deals

- Under the rules of the Securities and Exchange Commission (SEC) of the US, public companies are required to disclose transactions with a significant effect on the value of the company, e.g. license agreements
- Such agreements are filed and available to the public (cfr. www.SEC.gov)
- SEC is also a great source to find more information on mergers and acquisition or on the value of goodwill
  - Goodwill is an intangible asset which provides a competitive advantage such as a strong brand (cfr. trade names)
  - Goodwill needs to be taken up in the balance sheet besides the tangible assets

Enhancing Comparability

- It is often difficult to find deals closely related to your IP
- The market could have changed since the reference deal
- More competition could have entered the market
- Available information can be enhanced to your specific case by means of a scoring system
- The basis: evaluating your IP on various preset criteria in relation to or comparison with the same criteria for products in historical related deals

Enhancing Comparability

- Criteria:
  - Set of criteria needs to be determined related to the IP position and strengths, deal type, territory, life time, advantages, etc…
- Scale:
  - Choose a scale for the selected criteria: *e.g.* Likert scale, non-numerical or Crayola®
- Weight:
  - Not all criteria are equally important and therefore a weight should be given to each of the criteria used
- Scoring:
  - Scoring is done for the new IP in comparison to perceived value of the criteria related to the reference deals or industry standards
- Adapting:
  - After the scoring the numbers in the historical reference deals, or standards, need to be adjusted

Enhancing Comparability

Example:

- Cfr. deal terms on food safety modeling software
- Assuming we have a novel, better software and databases

Criteria	Scale					Weight	Score
Patent life time	1	2	3	**4**	5	2	8
Phase of development	1	2	3	4	**5**	2	10
Exclusivity	1	2	**3**	4	5	2	6
Competition	1	**2**	3	4	5	1	2
Advantage over others	1	2	**3**	4	5	1	3
Territory	1	2	3	**4**	5	1	4
Margins	1	2	3	**4**	5	1	4
Reference product = **3**						**TOTAL**	**37**

- The reference product as described in the deal would get a total score of 30
- Correction factor: the score for our product divided by the score of the reference product, in this example the correction factor = 37/30 = 1.23
- Correction factor can be used to determine estimated deal terms for our new IP

Enhancing Comparability

Food Safety Software	Deal Terms for novel software
Stage	Fully developed **SIMILAR**
IP	Software (©), Databases, Trademark, **SIMILAR**
Territory	Worldwide **SIMILAR**
Type	Exclusive, for all IP and its commercialization **SIMILAR**
Stage payments	If sales reach €1 mio €50000 **X1.23 = €61500** If sales reach €5 mio €200000 **X1.23=€246000**
Duration	10 years, afterwards all rights will go to licensee **SIMILAR**
Royalties	7% on Net Sales **x 1.23= 8.6% on Net Sales**

- More reliable estimate could be obtained if we would be able to identify a very low end deal and a very high end deal for our related technology.
- In the case we would be able to identified multiple related historical deals, we can assess the possible value of our new IP by clustering.

The “25 Percent Rule”

- What if no closely related industrial standards or historical deals can be found?
- A possible solution can be applying a general accepted rule of thumb
- Goldschneider *et al.* defines the over 40 years old rule as *“dividing the expected profits for the product or technology that incorporates the IP at issue in such a way that 25% is retained by the licensor (the seller) and that 75% goes to the licensee (the buyer)”*

The “25 Percent Rule”

- New IP is assumed to be generating new sales in a specific business sector
- It is possible to identify companies that are active in that specific sector
- In financial statements of the company we can find:

TURNOVER/SALES/REVENUES - **COGS**
= GROSS MARGIN - Sales and marketing expenses - Research and development - General overhead and administration - Other expenses
= EARNINGS/OPERATIONAL PROFIT BEFORE INTEREST AND TAXES (EBIT) - Interest - Taxes
= EARNINGS/OPERATIONAL PROFIT AFTER INTEREST AND TAXES

The “25 Percent Rule”

- For the 25 percent rule, we need the EBIT value
- EBIT can be expressed as a % of the original revenues
- The 25 percent rule states that a licensor could ask for 25% of this EBIT

The “25 Percent Rule”

Example: food and agricultural related in vitro diagnostics

- The company Biomerieux is an important industrial player
- Biomerieux is a public company (www.biomerieux.com)
- Financial data is available, *e.g.* the annual report 2009

Value		Percentage
Net sales	€1223.4 million	100%
Cost of sales (cfr. COGS)	- €563.8 million	- 46%
Gross profit (cfr. gross margin)	**€659.6 million**	**54%**
(other operating income	€12.5 million)	
Selling and marketing expenses	- €217.1 million	- 17.7%
General and administration expenses	- €98.7 million	- 8.1%
Research and development expenses	- €143.0 million	- 11.7%
Total operating expenses	**- €458.8 million**	- **37.5%**
Operating income before non-recurring items (cfr. EBIT) minus other operating income	**€200.8 million**	**16.4%**
Royalty on net sales	**4.10%** (25 percent rule)	

The “25 Percent Rule”

- 25% is of course for all IP needed to get the product produced and sold
- Licensees can argue that licensors should retain less than 25%
- Licensors can argue that the licensee should get less than 75%
- Important to compare the EBIT numbers from several players, since they can differ

Company	Revenues * (€ millions)	EBIT * (€ millions)	As % of revenues	% royalty on net sales **
Nestlé	71270	10397	14.6%	3.65%
Unilever	39823	5020	16.6%	3.15%
Kraft	28971	3963	13.7%	3.42%
General Mills	10539	1894	18%	4.49%
Grupo Bimbo	6233	645.7	10.4%	2.59%
Heinz	7182	1078	15%	3.7%
Cambell’s	5442	850.1	15.6%	3.9%
			Av. 14.84%	**3.56%**

**conversions are based on weighted average annual rates.*
***calculated as 25% of the EBIT.*

The “25 Percent Rule”

- What about new IP on processes for the production of known products?
- The 25 percent rule will not be applied on the revenues generated on the commercialized product
- It will be applied on gain resulting from the proprietary improved production process over the old production process
- Some other helpful rules of thumb:
  - Non-exclusive licenses are half or less compared to deal terms for exclusive licenses
  - Upfront/stage payments can be 5 to 10% of the total retained intrinsic value
  - Split profit for fully developed products
  - Upfront payment should minimum cover all IP related costs

The "FRAND Licensing Terms"

- There was a lot of debate regarding the 25% rule, especially since the Uniloc ruling in which the use of the 25% rule was barred.
  (Uniloc vs Microsoft, CAFC, Jan 4, **2011**)
- Alternative approaches are being developed and proposed.
- Fair, Reasonable And Non-Discriminatory (FRAND) licensing terms are based on equalizing the rates of return on investments made by the parties involved.
  (Granstrand *et al.* Les Nouvelles, 188-195, **2012**)
- Return On Investment (ROI):
  $= C_{returns}/I_{investment}$
  = (gains minus investments)/investments

The “FRAND Licensing Terms”

- For bilateral agreements (1 licensor and 1 licensee), the royalties on can be defined as:

$$L = \frac{Is}{Ib + Is} . \pi_{\text{opb}}$$

With L = royalty paid by Licensee (buyer).
I_S = investments made by the licensor (seller).
I_B = investments made by the licensee (buyer).
π_{opb} = operating profit of the licensee (buyer).

- The formula can be expanded towards multiple licensees and multiple licensors.

The “FRAND Licensing Terms”

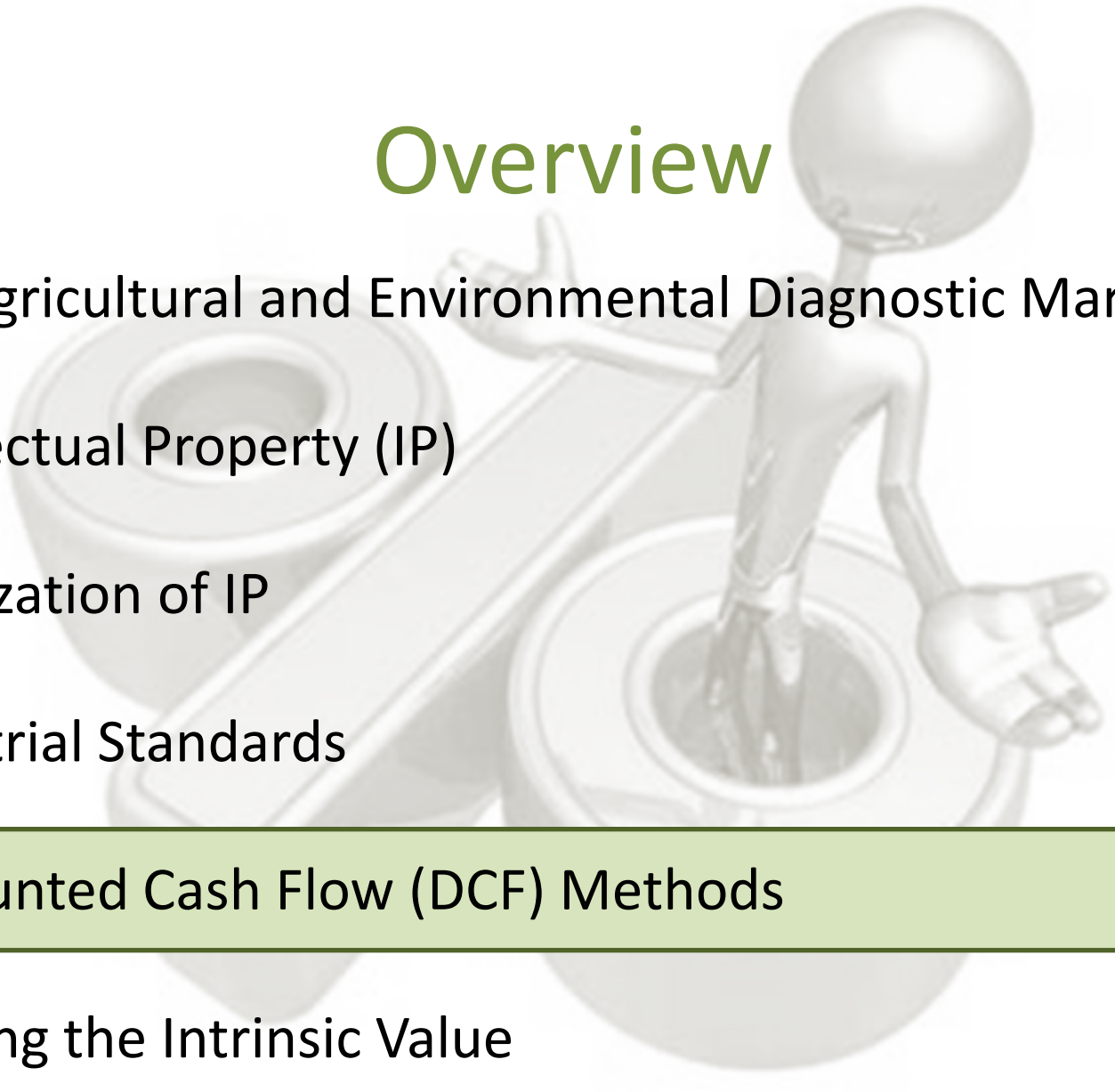
EXAMPLE

- A research company invested €2 mio for the development of a new diagnostic.
- The company licensed the commercialization to Biomerieux (with an of EBIT 16.4% of the turn-over) who invested €5 mio for further development.
- According to FRAND the royalties on Net Sales could be:

  L = (€2 mio / (€2mio + €5 mio)) x 16.4% on Net Sales
  = 4.69% on Net Sales

  (versus 4.10% when the 25% rule is followed)

Overview



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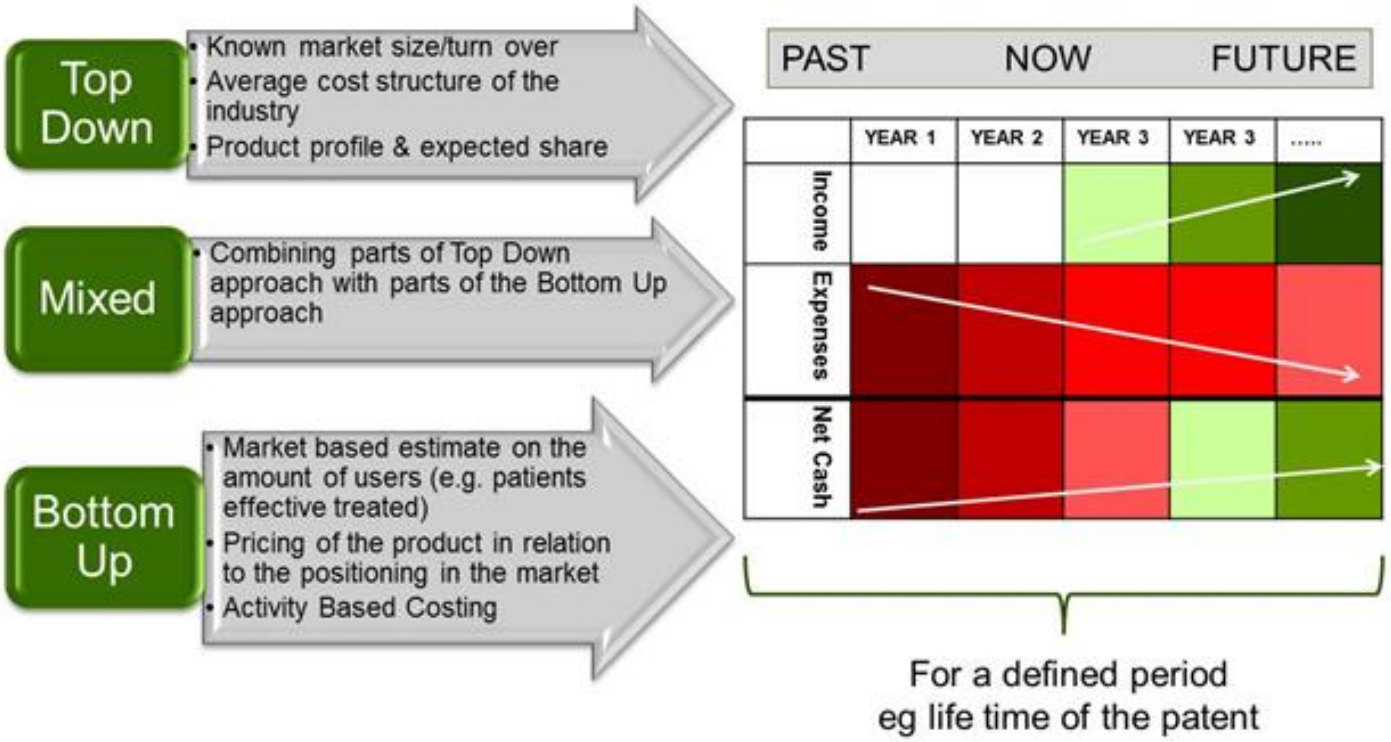
Introduction

- Previous methods are more general, somewhat empirical
- DCF method is much more mathematical
- Most used approach in industry to assess the value of IP
- The DCF method estimates, calculates via discounting what the actual value of future cash flows would be today
- The DCF method gives you the Net Present Value (NPV)

The Cash Flow Projections

- Determine the cash flows for the different years that are part of the NPV calculation
- All numbers that are given are estimations and the cash flows are *pro forma*



DCF Techniques

Net Present Value

$$\sum_{t=0}^{n} \frac{C_t}{(1+d)^t}$$

C_t = Cash flow @ year t for a total of n years

d = discount rate

The rate that a value is decreasing in time due to inflation, risk, …

- Should we do an investment of X now if we can expect cash flows Y in the future?

NPV < 0	bad investment
NPV = 0	profit equals the expected minimum
NPV > 0	profit is better than the expected minimum

DCF Techniques

Internal Rate of Return

$$\sum_{t=0}^{n} \frac{C_t}{(1+d)^t} = 0$$

For a given NPV, determine d

so that the NPV =0

- The IRR value is compared to a pre-set minimum i.e. the cut of rate of a minimum return/yield
- If the IRR is higher the project can be accepted
- If the IRR is lower the project is rejected

DCF Techniques

Pay Back Period (PP)

- PP is the time needed for the cash inflows to cover the (initial) investment.
- PP is one of the most popular alternatives to NPV.
- Example:

Time (year)	0	1	2	3	4
Cash out	**€ 60000**	€ 0	€ 0	€ 0	€ 0
Cash in	0	€ 10000	€ 20000	€ 30000	€ 40000

covers

→ Pay Back Period (PP) = 3 years

- The Pay Back Period Rule (PPR) is single: a particular cut-off period needs to be selected e.g. 3 years.
- Discounted Pay Back Period (DPP): first discount the cash flows before looking at the Pay Back Period.

DCF Techniques

Basic Risk-Adjusted DCF Techniques

Risk Adjusted Discount Rate NPV = NPV_{RADR}

- Instead of using a discount route that is based on e.g. WACC, a risk adjusted rate is used
- RADR (NPV) = $\sum_{t=0}^{n} \frac{Ct}{(1+r)^t}$

r = $R_F + R_B + R_P$ and $R_F + R_B$ = d e.g. WACC
R_F = risk free rate
R_B = adjustment for the normal business risk
R_P = adjustment for the risk of a specific project (positive or negative)

Certainty Equivalent Method (CE)

Is a method in which risky future cash flows are connected to certainty equivalent cash flows.

$NPV_{CE} = \sum_{t=0}^{n} \frac{C_t.\alpha_t}{(1+d)^t}$

C_t = the expected net cash flow in period t
α_t = the certainty equivalent factor associated with the risk for period t (e.g. $\alpha_1 = 0.70$ meaning a 70% probability to get C_1)
d = discount rate, risk free

Sensitivity analyses

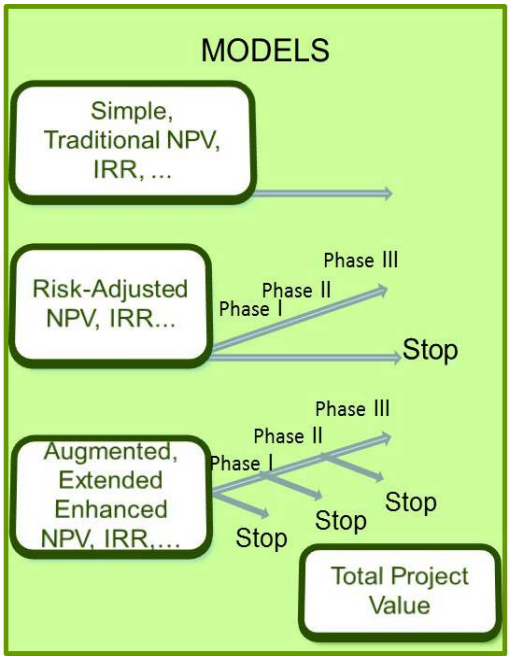
- Another approach to cope with uncertainty.
- Similar: scenario analyses.
- It examines how the NPV or IRR changes related to the assumptions made.

	Worst case	Expected	Best case
Income → Expenses → Risk (discount rate) → Timings →	↓	↓	↓
	NPV_W or IRR_W	NPV_E or IRR_E	NPV_B or IRR_B

→Expected NPV = **eNPV** = (NPV_W x $probability_W$) + (NPV_E x $probability_E$) + (NPV_B x $probability_B$)

→Σ probabilities = 1

The Cash Flow Projections



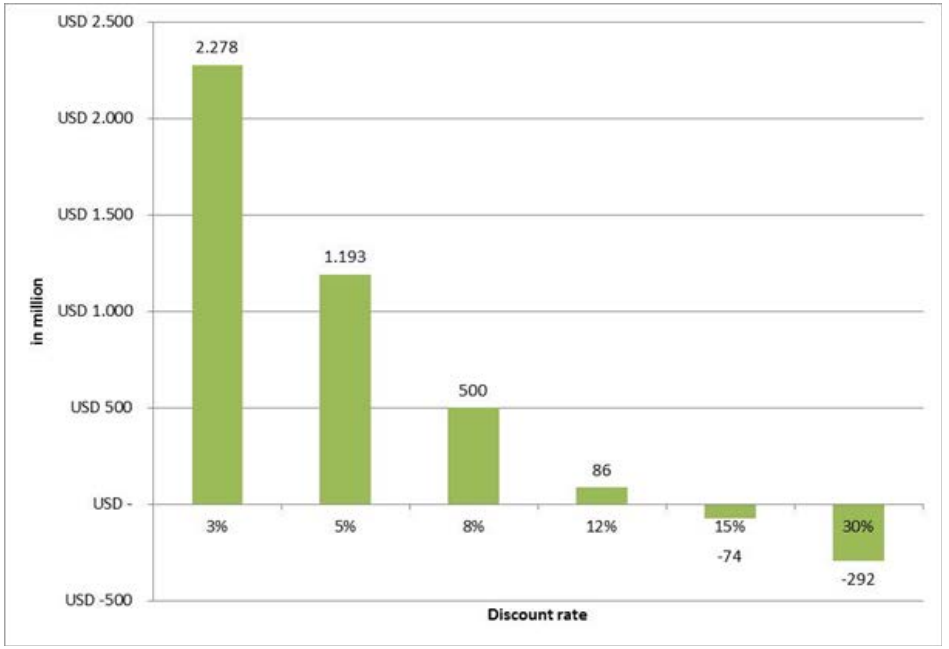
- Major drawback is the chance of error due to subjective estimation
- Different risks and uncertainties associated with a multi-stage cash flow (cfr. variable discount rates)

→ Several risk-adjusted DCF methods have been developed:

  - Monte Carlo methods in which the NPV calculation goes through multiple iterations using every time a different input value, the end-result being a frequency distribution of NPV
  - Decision Tree Analysis (DTA) uses a tree like graphic of decisions and the possible consequences, including probability expected values (for each branch)
  - Option Pricing Theory (OPT) methods, accounting for changing risk of future cash flows linked to the value of the share subject to the call option
  - These are more complicated and not part of this presentation

The Discount Rate ‘d’

The percentage used for the discount rate can have a significant impact on the intrinsic value of a project (NPV)

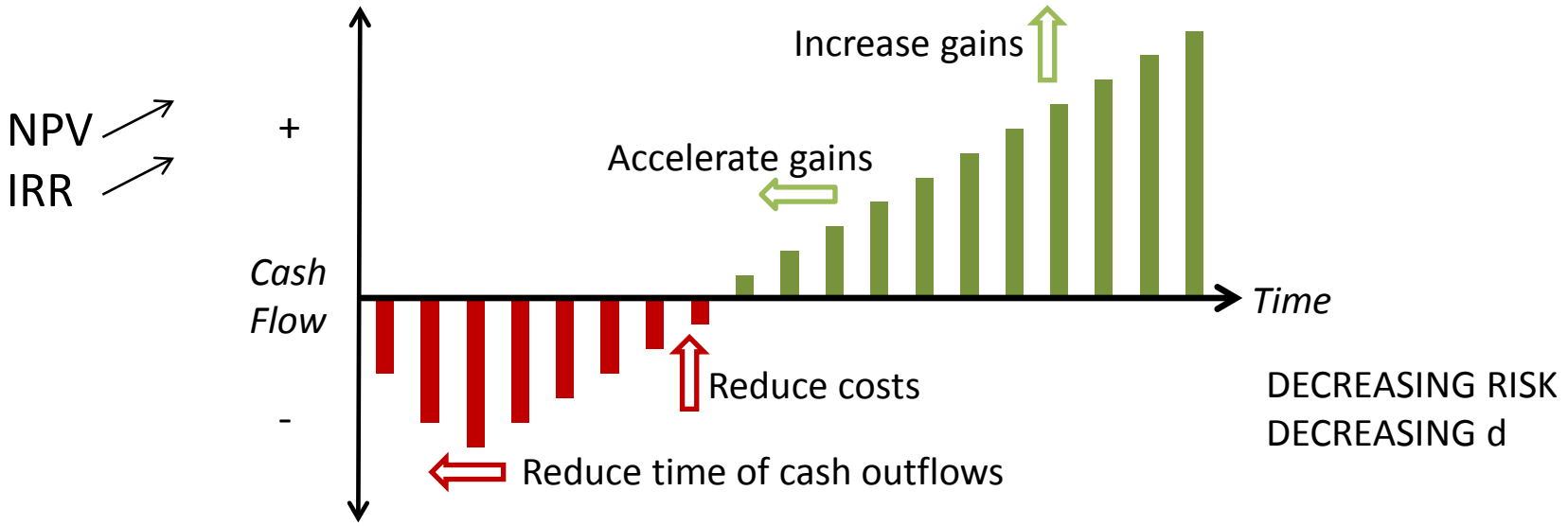


Which percentage should be used?

→3 important aspects that need to be taken in account:

1. The inflation
2. Alternative rates of return for investments
3. The risk associated with the project, both technological, scientific and economical

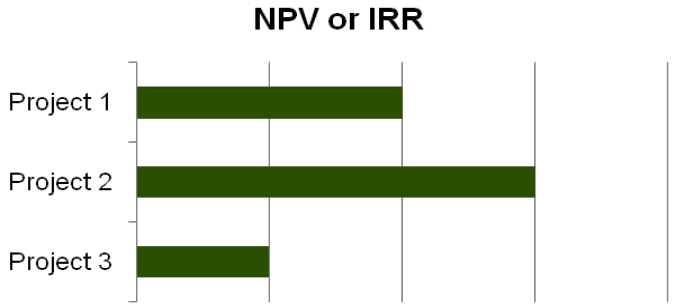
Factors Impacting DCF Techniques



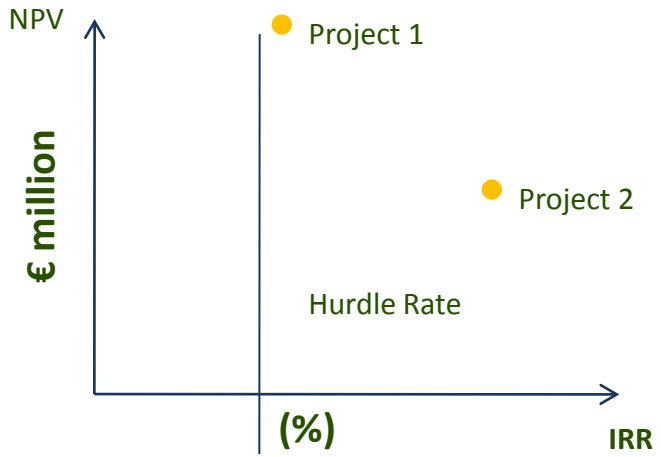
- Income, expenses, speed (timing), risk all have an impact on the method e.g. NPV, IRR etc.
- In order to have a better result in NPV one can increase sales, reduce cost, speed up commercialization etc.
- Nevertheless, it is important to be as realistic as possible with the assumptions.

Project Selection Methods

Projects can be evaluated on a single DCF criteria



Projects can be evaluated on multiple DCF criteria



Overview

- The Agricultural and Environmental Diagnostic Market
- Intellectual Property (IP)
- Valorization of IP
- Industrial Standards
- Discounted Cash Flow (DCF) Methods

- Dividing the Intrinsic Value

Dividing the Intrinsic Value

How can the intrinsic value of the new IP be divided between the licensor (the seller) and the licensee (the buyer):

1. Excess earnings concept

- If a licensee uses a discount rate where both his expected return on the investment as well as the risk related to the project is incorporated, than all of the "positive value" of the calculated NPV need to go to the licensor
  - The licensee buys the patent and pays a lump-sum equal to the NPV value
  - NPV value is spread via upfront payments, stage payments and royalties

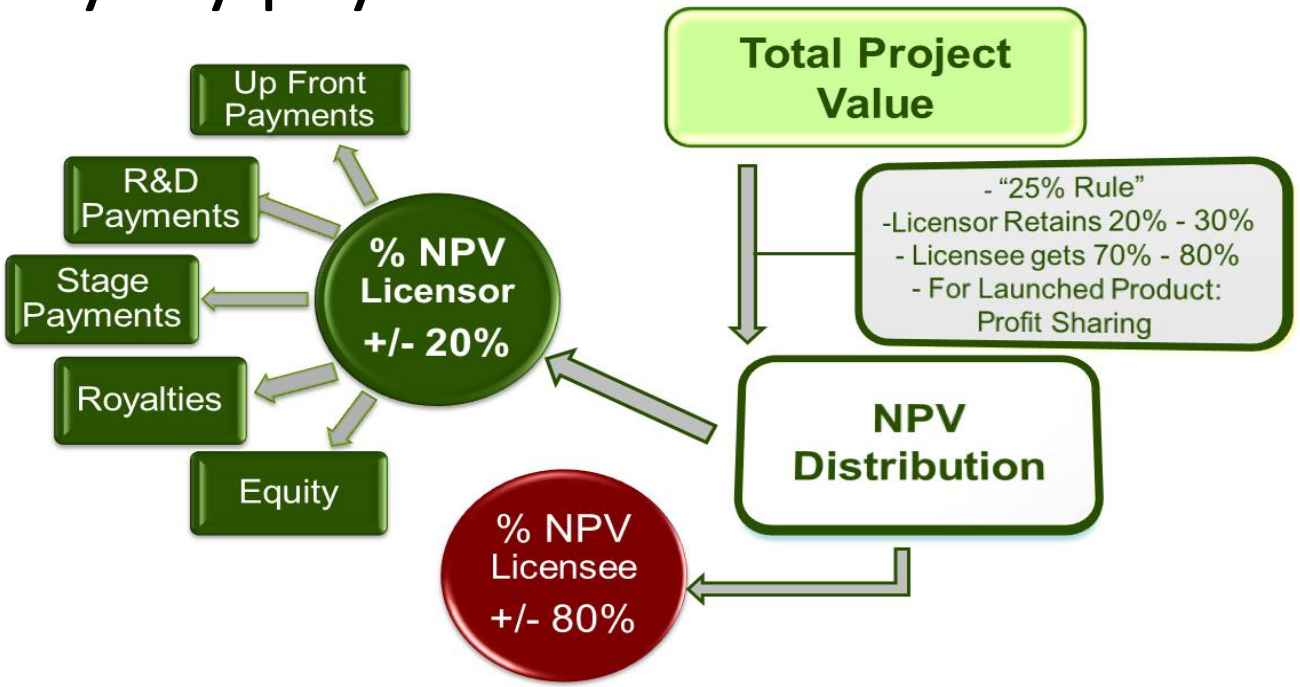
Dividing the Intrinsic Value

2. <u>The 25 percent rule</u>

- If seller and buyer agree that a discount rate will be used that provides only the appropriate present values of all the future benefits, given the risk of the project, than the resulting NPV value should be divided in a way that reflects the contribution of each party, *e.g.* using the 25 percent rule
- Building an excel model together with the “goal seek” function or “scenario manager” function can be very helpful

Dividing the Intrinsic Value

- This 25% of the NPV can be paid as a lump-sum or spread over time via upfront, stage and royalty payments



Dividing the Intrinsic Value

3. The FRAND Licensing Terms

- Similar to the 25% rule for dividing the value (NPV) of a project, also the FRAND approach can be used.
- In this case the NPV needs to be divided taking in account the investments made by each party.
- Also in this case an excel model together with the "goal seek" function or "scenario manager" function can be very helpful

Dividing the Intrinsic Value

ASSUMPTIONS		
number of chickens in 2013 (MIO)	66	
annual growth	1,10%	
rate of use	1,00%	
price per test	€ 60	
Initial R&D cost/year	€ 0,60	
Initial patent cost/year	€ 0,02	
COGS	45,56%	as a % of the turn-over
Sales & Marketing	16,87%	as a % of the turn-over
Gen & Admin	10,86%	as a % of the turn-over
Continuing R&D	6,26%	as a % of the turn-over
First year after Launch	10,00%	of the estimated Top Annual Sales
Second year after Launch	25,00%	of the estimated Top Annual Sales
Third year after Launch	50,00%	of the estimated Top Annual Sales
Fourth year after Launch	80,00%	of the estimated Top Annual Sales
Fifth till ninth year after Launch	100,00%	of the estimated Top Annual Sales
Decrease per year after ninth year	20,00%	of the estimated Top Annual Sales

Example

- Financial Valuation of a new diagnostic(s) for the GI health in chickens, including NE
- Used to compile a dossier for funding
- With involvment of the industry
- Forms a base for further discussions regarding commercial partnerships.

(in € MIO)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Number of flocks of chickens	66,00	66,73	67,46	68,20	68,95	69,71	70,48	71,25	72,04	72,83	73,63	74,44	75,26	76,09	76,92	77,77	78,63	79,49	80,36	81,25	82,14
Estimated maximum tests	0,66	0,67	0,67	0,68	0,69	0,70	0,70	0,71	0,72	0,73	0,74	0,74	0,75	0,76	0,77	0,78	0,79	0,79	0,80	0,81	0,82
Estimated *top annual sales*	€ 40	€ 40	€ 40	€ 41	€ 41	€ 42	€ 42	€ 43	€ 43	€ 44	€ 44	€ 45	€ 45	€ 46	€ 46	€ 47	€ 47	€ 48	€ 48	€ 49	€ 49
Turnover	€ 0	€ 0	€ 0	€ 0	€ 4	€ 10	€ 21	€ 34	€ 43	€ 44	€ 44	€ 45	€ 45	€ 36	€ 29	€ 23	€ 18	€ 15	€ 12	€ 9	€ 8
Initial R&D costs	€ 0,60	€ 0,60	€ 0,60	€ 0,60	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Initial Patent Costs	€ 0,00	€ 0,02	€ 0,02	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00
COGS	€ 0	€ 0	€ 0	€ 0	€ 2	€ 5	€ 10	€ 16	€ 20	€ 20	€ 20	€ 20	€ 21	€ 16	€ 13	€ 11	€ 8	€ 7	€ 5	€ 4	€ 3
Sales & Marketing	€ 0	€ 0	€ 0	€ 0	€ 1	€ 2	€ 4	€ 6	€ 7	€ 7	€ 7	€ 8	€ 8	€ 6	€ 5	€ 4	€ 3	€ 2	€ 2	€ 2	€ 1
Gen & Admin	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 2	€ 4	€ 5	€ 5	€ 5	€ 5	€ 5	€ 4	€ 3	€ 3	€ 2	€ 2	€ 1	€ 1	€ 1
R&D	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 1	€ 2	€ 3	€ 3	€ 3	€ 3	€ 3	€ 2	€ 2	€ 1	€ 1	€ 1	€ 1	€ 1	€ 0
Net cash	-€ 0,60	-€ 0,62	-€ 0,62	-€ 0,60	€ 0,85	€ 2,14	€ 4,32	€ 6,99	€ 8,84	€ 8,94	€ 9,03	€ 9,13	€ 9,23	€ 7,39	€ 5,91	€ 4,73	€ 3,78	€ 3,03	€ 2,42	€ 1,94	€ 1,55
Discounted net cash	-€ 0,60	-€ 0,56	-€ 0,51	-€ 0,45	€ 0,58	€ 1,33	€ 2,44	€ 3,59	€ 4,12	€ 3,79	€ 3,48	€ 3,20	€ 2,94	€ 2,14	€ 1,56	€ 1,13	€ 0,82	€ 0,60	€ 0,44	€ 0,32	€ 0,23
Acc. disc. net cash	-€ 0,60	-€ 1,16	-€ 1,68	-€ 2,13	-€ 1,55	-€ 0,22	€ 2,22	€ 5,81	€ 9,93	€ 13,72	€ 17,20	€ 20,41	€ 23,35	€ 25,49	€ 27,04	€ 28,18	€ 29,00	€ 29,60	€ 30,03	€ 30,35	€ 30,58

NPV (€ MIO)	**€ 31**
IRR	**60%**
Discount rate	10,00%
probability of success	40%
pNPV (€ MIO)	€ 12
pIRR	24%

Dividing the Intrinsic Value

LICENSEE (in € MIO)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Turnover	€ 0	€ 0	€ 0	€ 0	€ 4	€ 10	€ 21	€ 34	€ 43	€ 44	€ 44	€ 45	€ 45	€ 36	€ 29	€ 23	€ 18	€ 15	€ 12	€ 9	€ 8
Stage payments to Licensor			€ 0,30																		
Royalties to Licensor	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 1	€ 2	€ 2	€ 2	€ 2	€ 2	€ 2	€ 2	€ 1	€ 1	€ 1	€ 1	€ 1	€ 0	€ 0
COGS	€ 0	€ 0	€ 0	€ 0	€ 2	€ 5	€ 10	€ 16	€ 20	€ 20	€ 20	€ 20	€ 21	€ 16	€ 13	€ 11	€ 8	€ 7	€ 5	€ 4	€ 3
Sales & Marketing	€ 0	€ 0	€ 0	€ 0	€ 1	€ 2	€ 4	€ 6	€ 7	€ 7	€ 7	€ 8	€ 8	€ 6	€ 5	€ 4	€ 3	€ 2	€ 2	€ 2	€ 1
Gen & Admin	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 2	€ 4	€ 5	€ 5	€ 5	€ 5	€ 5	€ 4	€ 3	€ 3	€ 2	€ 2	€ 1	€ 1	€ 1
R&D	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 1	€ 2	€ 3	€ 3	€ 3	€ 3	€ 3	€ 2	€ 2	€ 1	€ 1	€ 1	€ 1	€ 1	€ 0
Net cash	€ 0	€ 0	€ 0	€ 0	€ 1	€ 2	€ 3	€ 5	€ 7	€ 7	€ 7	€ 7	€ 7	€ 6	€ 4	€ 4	€ 3	€ 2	€ 2	€ 1	€ 1
Discounted net cash	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 2	€ 3	€ 3	€ 3	€ 3	€ 2	€ 2	€ 2	€ 1	€ 1	€ 1	€ 0	€ 0	€ 0	€ 0
Acc. disc. net cash	€ 0	€ 0	€ 0	€ 0	€ 0	€ 1	€ 3	€ 6	€ 9	€ 12	€ 14	€ 17	€ 19	€ 21	€ 22	€ 23	€ 23	€ 24	€ 24	€ 24	€ 24

LICENSOR (in € MIO)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Stage Payments	€ 0,00	€ 0,00	€ 0,30	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00
Royalties	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,21	€ 0,52	€ 1,06	€ 1,71	€ 2,16	€ 2,18	€ 2,21	€ 2,23	€ 2,26	€ 1,81	€ 1,44	€ 1,16	€ 0,92	€ 0,74	€ 0,59	€ 0,47	€ 0,38
Initial R&D costs	€ 0,60	€ 0,60	€ 0,60	€ 0,60	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00
Initial patent costs	€ 0,00	€ 0,02	€ 0,02	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00	€ 0,00
Net cash	-€ 0,60	-€ 0,62	-€ 0,32	-€ 0,60	€ 0,21	€ 0,52	€ 1,06	€ 1,71	€ 2,16	€ 2,18	€ 2,21	€ 2,23	€ 2,26	€ 1,81	€ 1,44	€ 1,16	€ 0,92	€ 0,74	€ 0,59	€ 0,47	€ 0,38
Discounted net cash	-€ 0,60	-€ 0,56	-€ 0,26	-€ 0,45	€ 0,14	€ 0,32	€ 0,60	€ 0,88	€ 1,01	€ 0,93	€ 0,85	€ 0,78	€ 0,72	€ 0,52	€ 0,38	€ 0,28	€ 0,20	€ 0,15	€ 0,11	€ 0,08	€ 0,06
Acc. disc. net cash	-€ 0,60	-€ 1,16	-€ 1,43	-€ 1,88	-€ 1,74	-€ 1,41	-€ 0,82	€ 0,06	€ 1,07	€ 2,00	€ 2,85	€ 3,63	€ 4,35	€ 4,87	€ 5,25	€ 5,53	€ 5,73	€ 5,88	€ 5,98	€ 6,06	€ 6,12

Stage Payments (mio)	**€ 0,30**	NPV Licensee (mio)	€ 24 which is of the Project Value (total NPV):	**79,99%**
Royalty on Net Sales	**5%**	NPV Licensor (mio)	€ 6,12 which is of the Project Value (total NPV):	**20,01%**

What Deal Terms could we propose:

- 10% of 25% of the risk adjusted NPV as upfront payment = **€0.3 mio**
- The remaining part of the 25% of the NPV as royalties on Net Sales
- Set-up of model in EXCEL
- Use of "Goal Seek Function"

5% Royalties on Net Sales gives 80% of the Project Value to Licensee
20% of the Project Value to Licensor

THANK YOU FOR YOUR ATTENTION

More info:

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